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At subsequent rounds, this difference between men and women is upheld. For women at later rounds, both recent and past events accounted for the lower stability of the state-like variables. The effect of recent events remained after statistically controlling for the effects of previous status on the outcome variables. This consititutes an important verification of the nature of state-like outcome variables. This pattern was not ob-

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ABSTRACT

This study validates the developmental nature of internal-external locus of control in middle and old age. Longitudinal stability of locus of control in the face of particular changes in social milieu common during the transition from middle to late life was contrasted with that of verbal intelligence, a known stable characteristic, and that of affect balance, a mood indicator which is more influenced by changes in individual circumstances. Longitudinal data from the Duke Adaptation Study, in which 171 men and 174 women who initially ranged in age from 46 to 69 years were tested four times over an eight-year period, were used to estimate a separate path analytic model for each sex. While stability of locus of control across time is intermediate between verbal intelligence and affect balance, at all assessments it is closer in magnitude to affect balance. Cross wave coefficients of locus of control and affect balance are consistently smaller for women than for men, which is partially due to a greater sensitivity among women to changes in past and current social milieu. Results identify a differential nature of locus of control. (Author)

Internal-External Locus of Control in Middle and Late Life: The Search for Construct Validation

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Within the last decade, internal-external locus of control has become a widely used construct (see Lefcourt, 1976; Phares, 1973). While Rotter (1954, 1966, 1975) and others have specified the mechanisms which operate for the onset of locus of control; the developmental nature of the construct in adult life is relatively unexplored. Various reports have indicated that the construct is fully manifest and measurable in adolescence and can be assessed in young children (Crandall, Katkovsky, and Crandall, 1965; Davis and Phares, 1969; Katkovsky, Crandall, and Good, 1967; Shore, 1967)

But once the construct is developed, in what manner is it maintained in adult life and in old age? Most social learning theorists would argue that in a stable environment, the construct of locus of control will remain stable also, and that only under prolonged, significant change will the construct exhibit lagged change as a function of events. With such evidence, it could then be posited that locus of control behaves like a stable personality trait that is relatively unaffected by external events. On the other hand, Lefcourt (1973) referred to locus of control as a "choice of illusions" where, depending on the situation, one chooses to believe in personal control over external events. Behavioral responses are largely determined by one's perception of the event and one's perception of oneself with respect to the event. With such evidence, it could be posited that locus of control behaves like a personality state which is responsive to external events, and is an altering and situationally determined construct. Previous research offers support for both arguments.

Significant developmental change continues well into the later stages of the life span, but in contrast to child and adolescent development which is dominated by physical maturation per se, adult development is primarily social and psychological change as a function of life events and experiences,

at least until the onset of very old age where health factors may dominate (Flavell, 1970: Sheehy, 1976: Troll, 1975). Thus, the inclusion of life events as the primary cause of development in adulthood is fundamental to understanding in what manner locus of control is maintained in adult life.

To determine the state or trait-like nature of the construct, stability of locus of control was examined longitudinally in comparison to stability of affect balance and verbal capacity. They were examined in the context of the impact of typical life events indicative of change in the social milieu of older adults, and socioeconomic and demographic variables. Verbal intelligence (Matarazzo, 1972; Weschler, 1955) is one of the most stable characteristics in middle and old age, independent of neurological damage. Affect balance is known to sensitively detect the state rather than the trait nature of an individual's overall well-being, and captures mood changes in the elderly also (Breytspraak, 1974; Bradburn and Caplovitz, 1965). If locus of control is a generalized trait in late middle and old age, it should manifest consistent stability in the face of change in social milieu, and should parallel the trait criterion of verbal capacity. If, on the other hand, it is a state, locus of control should follow in response to changes in social milieu, as does affect balance.

METHOD

Subjects: Data for this investigation were from the Duke Adaptation Study, a longitudinal interdisciplinary survey which analyzed characteristic social, psychological, and physical adaptations to the aging process in American adults. Participants were examined four times at two year intervals

between 1968 and 1976 by a multidisciplinary team with a battery of assessment procedures.

Individuals ranged in age from 45-69 years at the onset of the study and were not institutionalized at its initiation. Only subjects who participated in all four rounds of the study and who had longitudinal data present on the locus of control scale comprised the sample (171 males and 164 females). About half of the sample attrition was due to death, and the remainder due to refusals. Refusals occurred evenly across age and sex, but death increased linearly with age and occurred more frequently among males (Rusin and Siegler, 1975).

Measures: The measure of locus of control was an 11-item scale derived from a 12-item scale developed by Jessor, Graves, Hanson, and Jessor (1967). One item was omitted because it was found in factor analysis not to cluster with the other 11 (Luikart, 1971). Jessor's scale was a forced choice interview adapted for work with an adult community sample and was intended to be comparable with other generalized locus of control measures. The affect balance scale used in this study was developed by Bradburn and Caplovitz (1965) to assess the relative balance of positive and negative feelings, and not simply the absence of negative ones. Verbal capacity was assessed by two subtests (Information and Vocabulary) of the Wechsler Adult Intelligence Scale (Wechsler, 1955) because only those two tests were available in the Adaptation Study. Life events, socio-economic indicators, and demographic variables were collected as part of the measurement battery. These variables are "exogenous," that is, their values are determined outside the system of relationships specified here and are included as control variables.

The hypotheses were tested by specifying and estimating two structural equation models, one for men and one for women, where each included the three constructs (verbal capacity, locus of control, and affect balance) as outcome variables and used the full set of predictors. For each sex, standardized coefficients for a recursive structural equation model were estimated using multiple regression. The most important results, i.e., the "stability" coefficients, are represented schematically in Figure 1 and 2. Although not reported here, mean levels of the outcome variable for the male and female subsamples are over time about equal. The sample is slightly above the median of each of the dependent measures scales, indicating a group of individuals with normal functioning in verbal capacity, affect balance, and locus of control.

Comparison of the schematic longitudinal structural equation models (Figs. 1&2) reveals that the stability of locus of control over time for both men and women is intermediate between verbal capacity and affect balance, and it is closer in magnitude to affect balance. Thus, results identify locus of control for both sexes as a state-like construct. As expected, verbal capacity is quite stable, with a range from .92 to .97 for the combined male and female subsamples. The combined range for locus of control stability is .47 to .65 with the female subsample manifesting slightly less stability than the male subsample. Affect balance, which has a combined range from .39 to .58, is the least stable for both sexes, although the male subsample at times manifests slightly less stability than the female subsample. Although not included in the figures, as an aside it should be generally noted that the amount of variance explained (R^2) in each dependent variable is about the same for both sexes across time, except at Round 1.

Here, more variance is accounted for in the women's models. Furthermore, at Round 1 amounts of variance explained (R^2) are not significantly different from zero for the men's state-like outcomes or for locus of control among women.

Further examination of the models reveals differences in the numbers and categories of predictors for men's and women's locus of control across time, particularly at Round 1. Time limitations prevent presentation of the effect of all exogenous demographic and life event variables (e.g., age, education, death of a parent, children leaving home, retirement, menopause, etc.)that were significant predictors of the endogenous variables (locus of control, affect balance, and verbal capacity) (see Table 1). Instead, only life events that occurred in the past (before Round 1) or occurred more recently (between subsequent consecutive rounds) are discussed. These categories of events (i.e., past vs. recent) are the basis for the following presentation of results. (Refer to Table 1 for a detailed list of the statistically significant life events that comprise these categories for each sex.) Among women at Round 1, locus of control is predicted by the category of variables called "past changes in social milieu," and this category also predicts their state-like affect balance at Round 1. However, among men at Round 1, nothing predicts the state-like stability of their locus of control.

At subsequent rounds, this difference between men and women is upheld. For women at later rounds, both recent and past events accounted for the lower stability of the state-like variables. The effect of recent events remained after statistically controlling for the effects of previous status on the outcome variables. This consititutes an important verification of the nature of state-like outcome variables. This pattern was not ob-

served in the male subsample.

Data were also analyzed with Heise's technique that separates reliability from stability. Those results show all three constructs act like traits. With reliability "removed" locus of control and affect balance had moderate reliability, while the reliability of verbal capacity is quite high. However, what these models attribute to "unreliability" (i.e., low reliability) could in fact be unique sources of state-like variation in affect balance and locus of control. (That is, low reliability does not necessarily refer to random error.)

What do these results indicate? Because locus of control and affect balance for both men and women are similar in stability but different from how they are initially predicted and maintained, it is apparent that locus of control among middle- and old-aged men, in contrast to women, is less influenced by social milieu. For women, the importance of past events in predicting initial locus of control is striking (see Table 1). The accumulation of past and recent events in predicting women's locus of control suggests that perhaps it has always been relatively responsive to change in social milieu, and some of its sensitivity is retained over time. Preliminary model estimations for men did include life events, socio-economic, and demographic predictors for locus of control which were eliminated because they did not meet statistical criteria. What might account for this apparent sex difference in locus of control? It seems there are differences between adult men and women in the salience of life events to psychological functioning, and it should be asked whether these events evoke a different response by sex. That is, are there distinct coping and adaptation mechanisms for males and females? The present research suggests that there are, at least in psychological constructs that are state-like in nature.

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Table 1

Exogenous Variables

	Variable Mnemonic	Description and Measurement
	OCCUP1[a] SOCC1[b]	Kind of work you (your spouse) do (did, if retired) 1 = farm labor (< 50 acres) 2 = unskilled 3 = service worker 4 = operatives, semi-skilled worker 5 = skilled craftsman; foreman 6 = clerical, sales, technician 7 = farmer (≥ 50 acres) 8 = manager or proprietor 9 = professional
	EDUC1	Highest number of years of school 1 = ≤ 8 years 2 = 9 through 12 years 3 = 13 through 16 years 4 = ≥ 17 years
	AGE1	= Chronological age in years at Round 1
	AGE1SQ	= $(AGE1-60)^2$
	CHLD1	If married, do you have children 0 = no 1 = yes
(M)	SRHLTH1	Number of complete sick days in the last year 0 = don't know 1 = ≥ 6 months 2 = 2 to 5 months 3 = 1 month 4 = 1 to 3 weeks 5 = less than one week 6 = none
(F)	SRHLTH[c]	
(F)	CHOME1	Any children still living at home 0 = yes 1 = no
(M)(F)	FADEC1	Father (mother) is deceased
(M)(F)	MODEC1	0 = no 1 = yes
(F)	SPABS1	Spouse absent through widowhood, divorce or separation
(F)	SPABS2[c]	0 = no 1 = yes

Table 1 (continued)

	Variable Mnemonic	Description and Measurement
(F)	RET1	Respondent retired 0 = no 1 = yes
(F)	RET3[c]	
(F)	SPRET1[b]	Respondent's spouse retired 0 = no 1 = yes
(F)	MENO1[b]	Menopause occurred to female respondent 0 = no 1 = yes

Table 1 (continued)

Endogenous Variables

Variable Mnemonic	Description and Measurement
LOCA	1 = external
⋮	⋮
LOCD	11 = internal
AABS	1 = low affect
⋮	⋮
DABS	33 = high affect
VSSA	1 = low verbal capacity
⋮	⋮
VSSD	124 = high verbal capacity

Note: [a]Number in each mnemonic indicates the round at which the variable was assessed.

[b]Answered by female respondents only.

[c]For these variables, a value of 1 indicates the event occured between subsequent consecutive rounds.

Figure 1.

Schematic Representation of the Longitudinal Structural Equation Model for Men

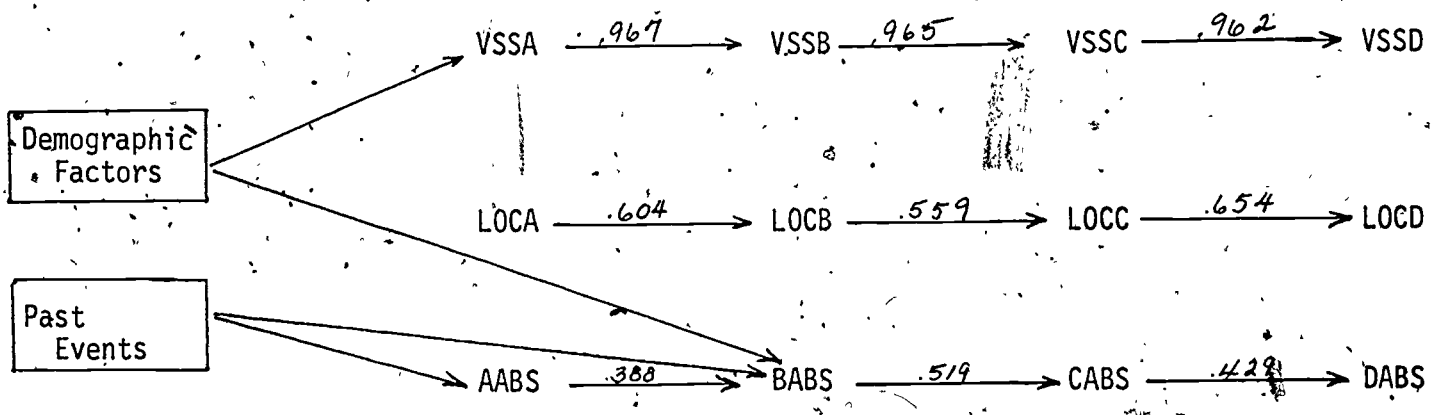

Figure 2.

Schematic Representation of the Longitudinal Structural Equation Model for Women